Box 516, Saint Louis, Missouri 63166 (314) 232-0232

20 February 1984

Mr. John D. Doyle, PE
Chief, Technical Services Section
Waste Management Program
Missouri Department of Natural Resources
P.O. Box 1368
Jefferson City, Missouri 65102

Enclosure: Table I-1, Closure Cost Estimates (Revision 2 dated 20 February 1984), five copies

REGISTERED MAIL - RETURN RECEIPT REQUESTED

Dear Mr. Doyle:

In compliance with the rules of the Department of Natural Resources Division 25 Chapter 7 Title 10 CSR 25-7.011 Section (6)(C)B., enclosed are the MDC-St. Louis Facility Tract I Storage Facility's most recent closure plan and cost estimates.

These pages are arranged so that a direct substitution for the current pages in Section I of our Part "B" application may be accomplished.

Sincerely,

MCDONNELL AIRCRAFT COMPANY

T. W. McMahon, Branch Manager
Environmental Compliance
Dept. 191C, Bldg. 305, L-4W

TWM:bem

EC: Mr. D. A. Wagoner
Director, Air and Waste Management Division
United States Environmental Protection Agency
Region VII
(letter with four copies of enclosure)

MCDONNELL DOUGLAS
CORPORATION

TABLE I-1
CLOSURE COST ESTIMATES

A. DRUM STORAGE FACILITY WEST OF BLDG. 39 (2 SHELTERS)

1. Dispose of all containers of hazardous waste at an EPA-approved disposal facility.
2. Remove any corrosion from metal shelter surfaces, deposit in drums, dispose of at an EPA-approved disposal facility.
3. Remove asphalt floor overlay and curb. Deposit in drums and dispose of at an EPA-approved disposal facility.
4. Fill sumps with sand, seal with concrete.
5. Dismantle shelters.

Total Estimated Cost: $64,800.00 R

B. SPENT CAUSTIC STORAGE TANKS EAST OF BLDG. 52 (2 TANKS)

1. Remove all liquid and sludge from tanks, dispose of at an EPA-approved disposal facility.
2. Decontaminate inside and outside of tanks.
3. Disconnect pumps, piping, valves, and fittings - decontaminate.
4. Dispose of decontamination fluids and equipment at an EPA-approved disposal facility.
5. Remove tanks.
6. Analyze asphalt and soil for contamination.
7. Remove contaminated asphalt and soil. Dispose of at an EPA-approved disposal facility.

Total Estimated Cost: $29,600.00 R

Table I-1 (Continued)

C. WASTE ACID STORAGE TANKS, BLDG. 52 (11 TANKS)

1. Remove all liquid and sludge from tanks. Dispose of at an EPA-approved disposal facility.
2. Decontaminate tanks and piping. Dispose of decontamination fluids at an EPA-approved disposal facility.
3. Remove tanks, piping, and platforms.
4. Analyze limestone and soil surrounding and under tanks; if contaminated, remove and dispose of at an EPA-approved hazardous waste landfill.

Total Estimated Cost: $25,300.00 R

D. UNDERGROUND WASTE OIL AND JET FUEL STORAGE TANKS (7 TANKS) R

1. Remove all waste oil or jet fuel.
2. Remove all sludge and residue from tanks.
3. Dispose of waste oil, jet fuel, sludge, and residue at an EPA-approved disposal facility.
4. Evacuate and remove tanks.
5. Analyze surrounding soil; if contaminated, remove and dispose of at an EPA approved hazardous waste landfill.
6. Fill in holes with fresh soil or limestone screening.

Total Estimated Cost: $104,500.00 R

E. SLUDGE HOLDING TANK, BLDG. 14

1. Remove all sludge; dispose of at an EPA-approved facility.
2. Wash down walls and floor of concrete tank.
3. Flush all piping, pumps, and centrifuges.

Total Estimated Cost: $30,800.00 R

Table I-1 (Continued)

F. EXPLOSIVES WASTE STORAGE FACILITY, BLDG. 10

1. Remove all explosive devices and material.
2. Sweep down walls, shelves, ledges, floors, etc. Remove hazardous residue.
3. Dispose of explosive devices, material, and residue at an EPA approved TSD facility.
4. Demolish building and dispose of rubble at local landfill.

Total Estimated Cost: $33,000.00 R

NOTE: All cost estimates assume the use of outside contract services and include 10% contingencies.

ATTACHMENT I

EMERGENCY COORDINATORS

The following is a tabulation of titles and the personnel filling these positions at this time. Telephone numbers have been provided for use during "off duty" hours.

	Title	Name	Off Duty Telephone No.
1.	Section Manager, Dept. 191C, Environmental Compliance	J. C. Patterson	(314) 567-1336
2.	Branch Manager, Dept. 191C, Environmental Compliance	T. W. McMahon	(314) 291-7255
3.	Manager, Dept. 190, Plant Engineering	R. E. Bishop	(314) 389-0467
4.	Director, Dept. 190, Plant Engineering	E. M. Myers	(314) 432-2107

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Engineer's Certification

This is to certify that this application has been prepared to comply with the regulations of the Resource Conservation and Recovery Act and all applicable standards, rules, and regulations for hazardous waste storage facilities. It is my understanding that this facility has been designed to provide adequate protection of the health of humans and other living organisms.

Registered Professional Engineer Submitting Plans

Name: Earl M. Myers (Director)

Phone: (314) 234-7058

Name of Consulting Firm: Plant Engineering Department
(McDonnell Aircraft Company)

Address: P.O. Box 516, St. Louis, Missouri 63166

Signature: Earl M Myers

Registration Number: E 8041

Date: 2 MAR 84

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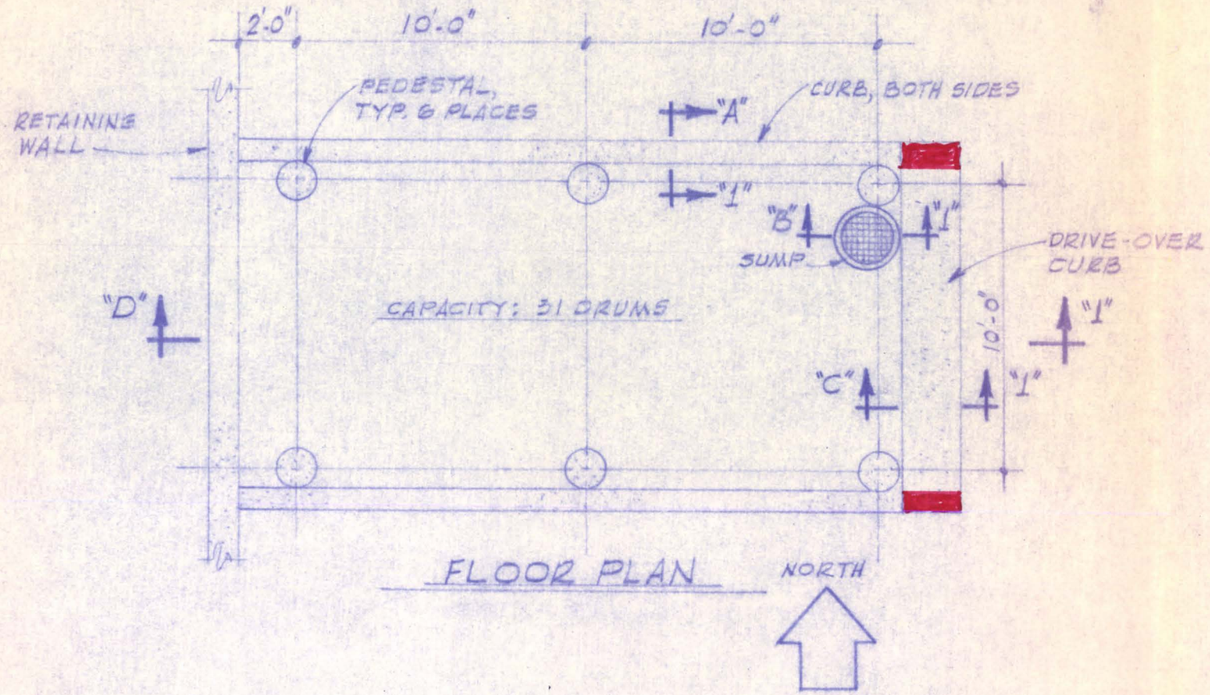
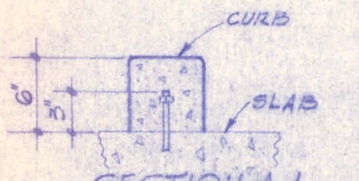
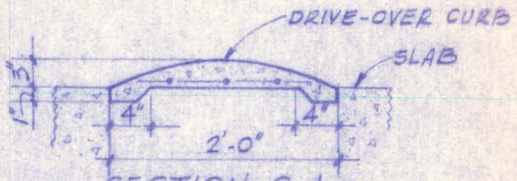
ENCL NO 3



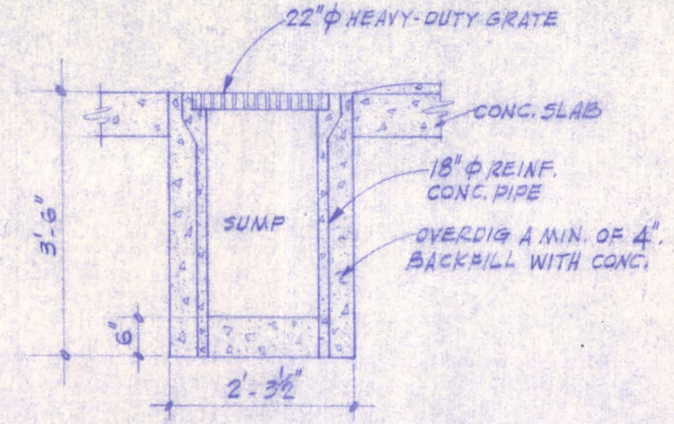
FLOOR PLAN



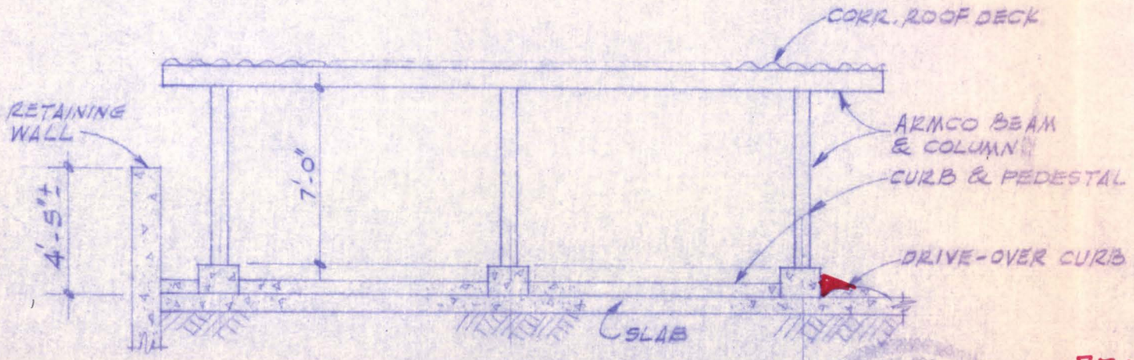
SECTION A-1



SECTION C-1



SECTION B-1



SECTION D-1

REV. SHOWN IN RED

FIGURE D-2

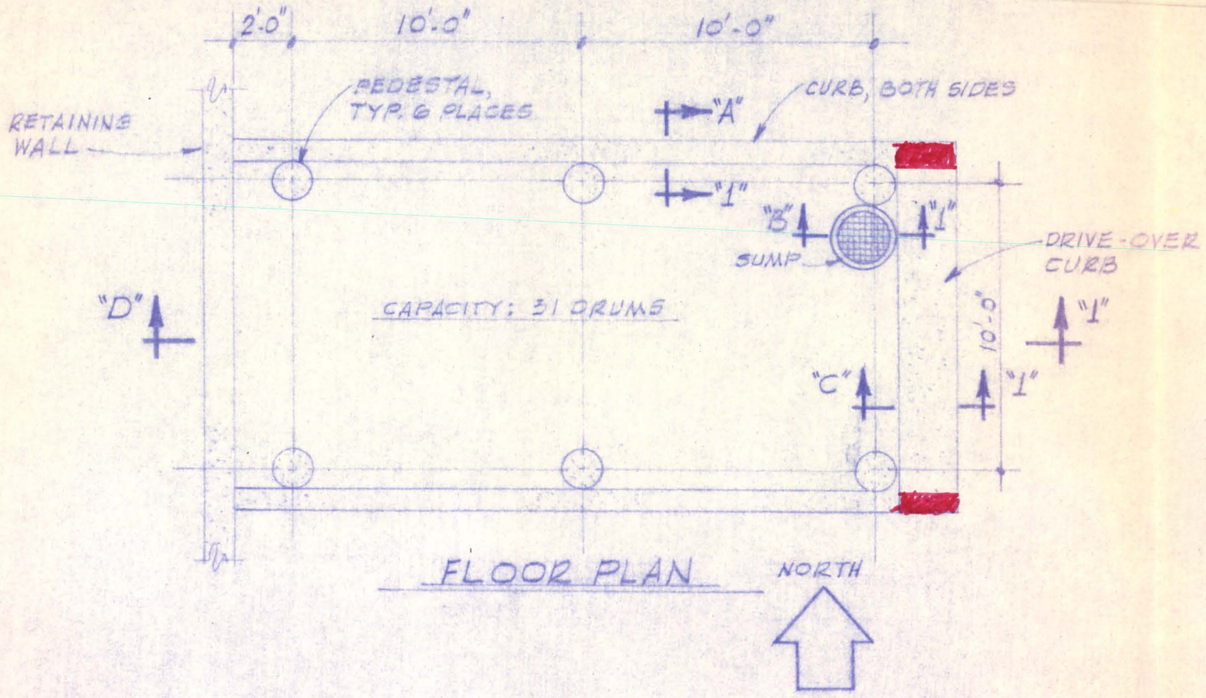
SCALE	NONE		
DRAWN	C.L. COHEN		
APPROVED	J.W. Mueller	9/24/82	
APPROVED	Earl M. Myers	9-27-82	
R.F.F.O.		F.O.	

MDC - ST. LOUIS
HAZARDOUS WASTE STORAGE
TRACT I - CYANIDE / STORAGE

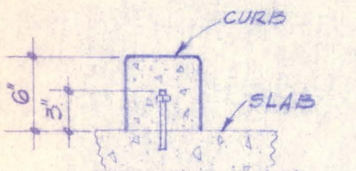
APPROVED FOR CONSTRUCTION
BY
DATE

MCDONNELL AIRCRAFT COMPANY
MCDONNELL DOUGLAS CORPORATION
PLANT ENGINEERING
SKPE SHEET 1 OF 1

ENCL No. 3



FLOOR PLAN



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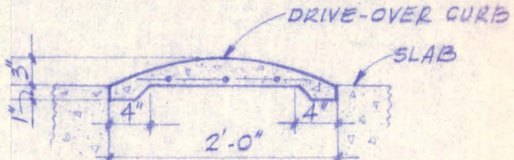

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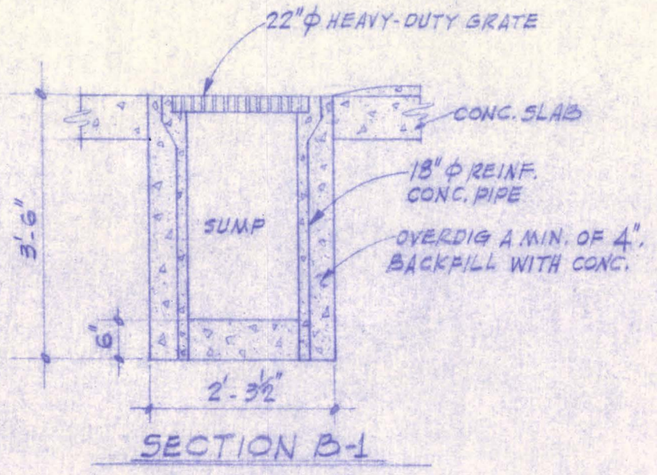

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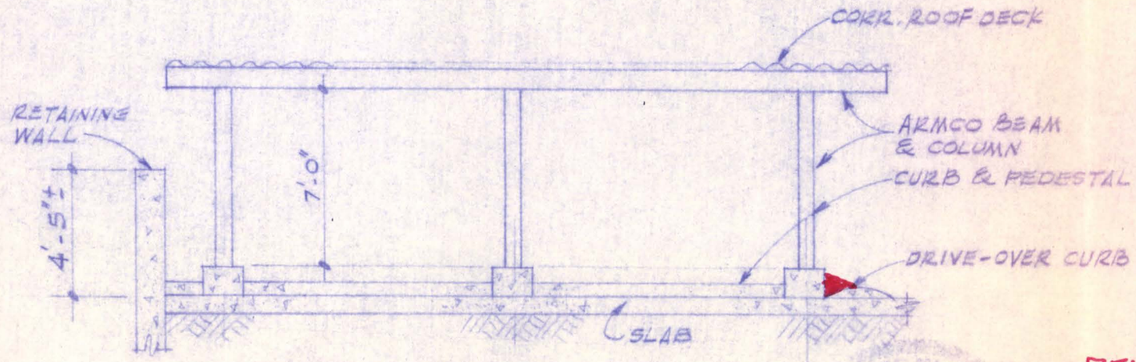

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REV SHOWN IN RED

FIGURE D-2

SCALE	NONE		MDC - ST. LOUIS HAZARDOUS WASTE STORAGE TRACT I - CYANIDE / STORAGE
DRAWN	C.L. COHEN		
APPROVED	J.W. Mueller	9/29/82	APPROVED FOR CONSTRUCTION
APPROVED	Earl M. Myers	9-27-82	BY
R.F.F.O.	F.O.		DATE

MCDONNELL AIRCRAFT COMPANY
MCDONNELL DOUGLAS CORPORATION
PLANT ENGINEERING
SKPE SHEET 1 OF 1

LIST OF ATTACHMENTS

LIST OF ATTACHMENTS

MCDONNELL DOUGLAS CORPORATION

STANDARD MAINTENANCE PROCEDURE

S.M.P. No. 190-70-13

TITLE: HYDROCARBON LEAK DETECTORS FOR UNDERGROUND TANKS

EFFECTIVE: 25 JANUARY 1984

PLANT ENGINEERING

A. PURPOSE

To establish procedures and responsibilities for equipment operation

B. SCOPE

This procedure covers the operation and maintenance of the leak detectors associated with the storage of hazardous hydrocarbon wastes in underground tanks in Tract I.

C. EQUIPMENT AND/OR MATERIALS

1. Mallory "Pollulert" Hydrocarbon Detection System, consisting of an electronic control box, Model POL 101 - bench mount
2. Mallory "Pollulert" Ground Water Probes, Model POL 204
3. Mallory "Pollulert" Connecting Cable, Model POL 312
4. Monitoring wells, consisting of 6-inch I.D. Schedule 40 PVC pipe slotted (well casing)

D. GENERAL

1. The principle of operation is as follows.

   1.1 The Pollulert Hydrocarbon Detection System continuously monitors the thermal conductivity of the fluid surrounding the sensor. Thermal conductivity is the rate of heat transfer per unit area (calories/second, cm^2) per unit temperature gradient (°C/cm). Hydrocarbon thermal conductivity is in the narrow range of .0003 to .0005, compared to .0013 for water and .00006 for air.

   1.2 The sensor consists of a semiconductor junction, which is heated by passing a constant current through it for a constant time period. The temperature of the sensor is then measured. It is then allowed to cool for another time period and again measured. The difference between these two temperatures is a function of the thermal conductivity of the surrounding medium. The cycle is then repeated.

   1.3 A microprocessor is used to perform the various operations of cycling, measuring, storing, and calculating. It is programmed to signal when a temperature difference corresponding to the thermal conductivity of hydrocarbon, air, or water is measured. Measurements are averaged over a number of cycles to assure against false signals.

1. 1.4 Long-term stability, even during extended power outages, is assured by providing a calibrated reference point in the form of a variable resistor, which is set during installation. If recalibration is needed, the electronic control is switched into the calibrate mode while the sensor is immersed in water. The microprocessor will automatically perform a 10-minute calibration cycle and will indicate a new setting of the variable resistor. Hydrocarbon is not needed for calibration.

2. Operating Instructions

2.1 On/Off switch should be on and calibrate monitor arrow should point to "Monitor."

2.2 Turn the Off/Loud control clockwise to place hydrocarbon alarm in standby condition. If hydrocarbon is detected at any sensor, the audible alarm will sound. Advancing the control further clockwise increases the audible output of the alarm. To turn off or defeat the alarm, turn the control counterclockwise until a click is heard. Sensor lamps, relay contacts, and 0 to 6 VDC output will continue to operate, even though the audible alarm is silenced.

2.3 Interpreting Sensor Lamps

2.3.1 Under normal operating conditions, all lamps should be off.

2.3.2 If hydrocarbon is detected at a sensor, the red sensor lamp will flash on and off.

2.3.3 If ground water probes should not float, but become dry, the yellow lamp will flash. The probes should be inspected to determine if the float has hung up and become high and dry or if the well has gone dry. It is not necessary that water be present; hydrocarbon that enters a dry well will be detected.

2.3.4 The cable to the probe is monitored by the Pollulert System. If, for some reason, the cable is severed, or the sensor should fail (open circuit), the yellow lamp for the sensor will light continuously.

2.3.5 Any change in the status of a sensor between the mediums of air-water-hydrocarbon will be indicated by the visual indicators after two to four minutes.

3. Operational Responsibilities

3.1 Calibration - Maintenance

3.1.1 The procedure for functional calibration is as follows. The leak detection system is checked for functional operation every 13 weeks. This functional check consists of removing each of the underground leak detection probes from their respective monitoring wells and placing each detector probe into a container of ethylene glycol. This simulates the detection of hydrocarbons in the monitoring well. A properly functioning probe causes a visual and audio alarm to occur. After the probe and alarm system are proven to be functional, they are marked with a Calibration Department seal that reflects the date and inspector's name.

Note: This functional calibration technique has been verified as being a valid functional check by Mr. Darryl Day of Pollulert Systems, Mallory Components Group, Indianapolis, Indiana [telephone (317) 856-3857].

D. 3. 3.1 3.1.2 Repair leak detection system.

3.2 Alarm Response

3.2.1 When an alarm sounds, the responsible Plant Engineering area supervisor will take the following action:

a. Record source of alarm;

b. Turn off audible alarm;

c. Inspect the area for evidence of leakage, tank rupture, spill, etc. If a problem is apparent, immediately begin action to stop the source, begin cleanup activities, and then notify Environmental Compliance; OR

If no cause for the alarm can be visually detected, report this condition to Environmental Compliance;

d. Contact Environmental Compliance as follows.

On Monday through Friday (8:00 a.m. to 4:30 p.m.), telephone Sta. 23319, Environmental Compliance, and report the alarm situation.

On all other times (including holidays), contact the MDC telephone "Operator" and report a "Pollution Problem."

3.3 Environmental Compliance

3.3.1 On each workday, inspect each detector for proper operation.

3.3.2 Request equipment repairs whenever detectors or storage tanks are not operating as designed.

3.3.3 Respond to and resolve all reports of detector alarms.

3.3.4 Provide instructions and directions for decontamination as required by environmental law.

Prepared by: J. C. Patterson, Section Manager
Environmental Compliance
Department 191C

Approved by: T. W. McMahon, Branch Manager
Environmental Compliance
Department 191C

Approved by: R. E. Bishop, Manager
Plant Engineering
Department 190

Approved by: E. H. Ladage, Manager
Maintenance
Department 190

Approved by: E. M. Myers, Director
Plant Engineering
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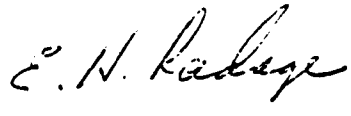
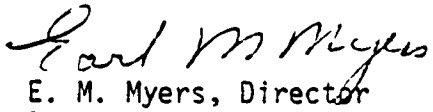


Approved by: E. H. Ladage, Manager
Maintenance
Department 190



Approved by: E. M. Myers, Director
Plant Engineering
Department 190

I-1c Maximum Waste Inventory

1. Drum storage facility at Bldg. 27 scrap dock - 360 full drums and 396 empty drums
2. Spent caustic tanks east of Bldg. 52 - 20,000 gallons
3. Titanium etch storage tanks at Bldg. 52 - 4,500 gallons R
4. Steel chem-mill storage tanks at Bldg. 52 - 2,500 gallons
5. Underground waste jet fuel tank, Bldg. 28 - 5,000 gallons
6. Underground waste jet fuel tank at Fuel Pit #3 - 2,000 gallons
7. Underground waste jet fuel tank behind Hush House - 3,380 gallons R
8. Underground waste jet fuel tank by F-18 Silencer - 2,000 gallons
9. Underground waste oil tank east of Bldg. 6 - 1,000 gallons
10. Sludge holding tank at Bldg. 14 - 120,000 gallons
11. The explosives storage facility, Bldg. 10 - 100 pounds
12. Underground waste jet fuel tank at Fuel Pit #4 - 2,000 gallons R
13. Underground waste jet fuel tank at Ramp Station 1 and 2 - 4,380 gallons R

I-1d Inventory Removal and Disposal or Decontamination of Equipment R

1. Drum storage facility west of Bldg. 39: Remove all remaining drums and ship to EPA-approved disposal facilities - four weeks. Remove corrosion from metal and empty and decontaminate sump - two weeks. Analyze asphalt overlay to determine if it is contaminated with hazardous waste - one week. Remove asphalt (if hazardous) and dispose of it at an EPA-approved disposal facility - four weeks. Fill sumps with sand and seal with concrete - one week. Either convert the building to other use or demolish it and salvage the metal as scrap iron.

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Total Estimated Cost: $64,800.00 R

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1. Remove all waste oil or jet fuel.
2. Remove all sludge and residue from tanks.
3. Dispose of waste oil, jet fuel, sludge, and residue at an EPA-approved disposal facility.
4. Evacuate and remove tanks.
5. Analyze surrounding soil; if contaminated, remove and dispose of at an EPA approved hazardous waste landfill.
6. Fill in holes with fresh soil or limestone screening.

Total Estimated Cost: $104,500.00 R

E. SLUDGE HOLDING TANK, BLDG. 14

1. Remove all sludge; dispose of at an EPA-approved facility.
2. Wash down walls and floor of concrete tank.
3. Flush all piping, pumps, and centrifuges.

Total Estimated Cost: $30,800.00 R

Table I-1 (Continued)

F. EXPLOSIVES WASTE STORAGE FACILITY, BLDG. 10

1. Remove all explosive devices and material.
2. Sweep down walls, shelves, ledges, floors, etc. Remove hazardous residue.
3. Dispose of explosive devices, material, and residue at an EPA approved TSD facility.
4. Demolish building and dispose of rubble at local landfill.

Total Estimated Cost: $33,000.00 R

NOTE: All cost estimates assume the use of outside contract services and include 10% contingencies.

TABLE I-1
CLOSURE COST ESTIMATES

A. DRUM STORAGE FACILITY WEST OF BLDG. 39 (2 SHELTERS)

1. Dispose of all containers of hazardous waste at an EPA-approved disposal facility.
2. Remove any corrosion from metal shelter surfaces, deposit in drums, dispose of at an EPA-approved disposal facility.
3. Remove asphalt floor overlay and curb. Deposit in drums and dispose of at an EPA-approved disposal facility.
4. Fill sumps with sand, seal with concrete.
5. Dismantle shelters.

Total Estimated Cost: $64,800.00 R

B. SPENT CAUSTIC STORAGE TANKS EAST OF BLDG. 52 (2 TANKS)

1. Remove all liquid and sludge from tanks, dispose of at an EPA-approved disposal facility.
2. Decontaminate inside and outside of tanks.
3. Disconnect pumps, piping, valves, and fittings - decontaminate.
4. Dispose of decontamination fluids and equipment at an EPA-approved disposal facility.
5. Remove tanks.
6. Analyze asphalt and soil for contamination.
7. Remove contaminated asphalt and soil. Dispose of at an EPA-approved disposal facility.

Total Estimated Cost: $29,600.00 R

Table I-1 (Continued)

C. WASTE ACID STORAGE TANKS, BLDG. 52 (11 TANKS)

1. Remove all liquid and sludge from tanks. Dispose of at an EPA-approved disposal facility.
2. Decontaminate tanks and piping. Dispose of decontamination fluids at an EPA-approved disposal facility.
3. Remove tanks, piping, and platforms.
4. Analyze limestone and soil surrounding and under tanks; if contaminated, remove and dispose of at an EPA-approved hazardous waste landfill.

Total Estimated Cost: $25,300.00 R

D. UNDERGROUND WASTE OIL AND JET FUEL STORAGE TANKS (7 TANKS) R

1. Remove all waste oil or jet fuel.
2. Remove all sludge and residue from tanks.
3. Dispose of waste oil, jet fuel, sludge, and residue at an EPA-approved disposal facility.
4. Evacuate and remove tanks.
5. Analyze surrounding soil; if contaminated, remove and dispose of at an EPA approved hazardous waste landfill.
6. Fill in holes with fresh soil or limestone screening.

Total Estimated Cost: $104,500.00 R

E. SLUDGE HOLDING TANK, BLDG. 14

1. Remove all sludge; dispose of at an EPA-approved facility.
2. Wash down walls and floor of concrete tank.
3. Flush all piping, pumps, and centrifuges.

Total Estimated Cost: $30,800.00 R

Table I-1 (Continued)

F. EXPLOSIVES WASTE STORAGE FACILITY, BLDG. 10

1. Remove all explosive devices and material.
2. Sweep down walls, shelves, ledges, floors, etc. Remove hazardous residue.
3. Dispose of explosive devices, material, and residue at an EPA approved TSD facility.
4. Demolish building and dispose of rubble at local landfill.

Total Estimated Cost: $33,000.00 R

NOTE: All cost estimates assume the use of outside contract services and include 10% contingencies.